

Appl. No. 10/668,493
Reply to Office Action of June 20, 2005

REMARKS/ARGUMENTS

Claim Amendments

By the amendments presented, Claims 1-9 are canceled. Cancellation of these claims is done without prejudice to applicants' right to pursue these canceled claims via one or more continuing applications.

Further by the amendments presented, Claim 10 is rewritten to direct it to the process embodiment wherein introduction of a flocculant into the molecular sieve synthesis mixture causes the synthesized molecular sieve particles to settle to the bottom of the synthesis mixture reaction vessel. Support for this amendment to Claim 10 is found in the original specification in Paragraph 0013 on Page 5 and in original Claim 20.

Further by the amendments presented, Claims 10 and 20 are rewritten to quantify the temperature used in the heat treatment step of the claimed processes as being between about 50 °C and about 250 °C. Support for these amendments to Claims 10 and 20 is found in the original specification in Paragraph 0012 on Page 4.

Further by the amendments presented, corrections are made to the recited dependencies in Claims 28 and 29.

Upon entry of the claim amendments presented, Claims 10-50 remain in the application. No additional claims fee is due as a result of the claim amendments made.

Invention Synopsis

As currently claimed, the present invention is directed to the preparation of molecular sieves and molecular sieve-containing catalyst compositions. In such preparation, molecular

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sieves are recovered from their synthesis mixture by introducing a flocculant to that synthesis mixture to cause the molecular sieve material to settle to the bottom of the synthesis mixture reaction vessel. Such settled molecular sieve material is then recovered and subjected to heat treatment at a temperature between about 50 °C and about 250 °C. Molecular sieves which have been recovered and treated in this manner contain some residual flocculating agent. When incorporated into catalyst composites with binder and matrix material, these molecular sieves impart especially desirable improved attrition resistance to the resulting catalyst compositions. Such improved catalyst compositions are, in turn, especially useful for promoting conversion of oxygenate feedstocks to light olefins.

Restriction Requirement

The Examiner has subjected the present application to a restriction requirement under 35 USC §121 by identifying the following two claim groups:

Group I. Claims 1-29, drawn to a method of making a catalyst composition, classified in Class 502, subclass 60+;

Group II. Claims 30-50, drawn to a process for making olefins, classified Class 585, subclass 640

The Examiner contends that restriction is proper because the "inventions" of Groups I and II are "distinct" and have "acquired a separate status in the art". Applicants respectfully traverse this restriction requirement.

The basis for the Examiner's conclusion that the Group I and Group II "inventions" are distinct is the allegation that these two claim groups are "unrelated." Applicants would respectfully submit, however, that the methods and processes of these two claim groups are, in fact, very related. The benefits which arise in the oxygenate and other conversion processes of

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the Group II claims are the result of using in those processes a catalyst which has been made in accordance with the methods of the Group I claims. The Group II claims, in fact, either now recite or will be amended to recite the Group I catalyst-making steps as a subset of all of the steps in the Group II processes.

Given the relationship which exists between the two claim groups, and whether or not the inventions of such claim groups are properly characterized as "distinct", prosecution of claims of these two types in a single application should be permitted unless an undue searching burden would be placed upon the PTO in conducting a patentability search with respect to all of these claims. Notwithstanding the Examiner's assertion of differing classifications and "separate status in the art", it is submitted that any prior art search set up for Group I should be coextensive with and identical to any search for Group II. After all, the catalyst-making steps represent the only elements of the Group II claims which impart novelty to the various integrated processes of Group II. So the novel element in the claims of both groups is exactly the same. Given this situation, it is submitted that it cannot be properly concluded that searching both claim groups together would present an "undue" searching burden for the Examiner.

In view of the foregoing remarks, it is respectfully requested that the Examiner reconsider and withdraw the requirement for restriction and allow all of the originally presented claims to be prosecuted in the same application. Notwithstanding the above arguments and the request for reconsideration, in the event the Examiner's restriction requirement is made final, applicants hereby confirm the previously made provisional election to prosecute the claims of Group I (now Claims 10-29) holding Claims 30-50 (Group II) in abeyance under the provisions of 37 CFR §1.142(b) until final disposition of the elected claims.

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Art Rejections

Rejections Over Herbst et al

Of the claims remaining after the amendments presented herein, Claims 10 and 12-29 have been rejected under 35 USC §102(b) [Claims 10, 12, and 14-29], or alternatively under 35 USC § 103 [Claim 13], as being anticipated or rendered unpatentably obvious by Herbst et al (U.S. Patent No. 5,051,164, hereinafter "Herbst"). The Examiner contends that the Herbst disclosure of ZSM-5 being crystallized from a slurry which is contacted by a flocculant, followed by zeolite crystal recovery, drying and addition to binder and matrix to make a catalyst composite, anticipates or obviously suggests all of the elements of the rejected claims. Such a rejection over Herbst is respectfully traversed as it would apply to Claims 10 and 12-29 as amended herein.

Herbst discloses cracking catalyst composites formed by spray drying a reaction mixture which contains a shape selective crystalline silicate, unincorporated silica and an inorganic oxide binder precursor. Example 1 of Herbst shows preparation of ZSM-5 zeolite crystals from a reaction mixture. In Example 1, a slurry of ZSM-5 is recovered by adding a flocculant to the reaction mixture, allowing the ZSM-5 to settle, decanting supernatant liquid, repeating this procedure several times, and then finally filtering to form a ZSM-5 filter cake containing 33.4% solids. In an Example 3 of Herbst, this ZSM-5 filter cake is added to a slurry containing sodium silicate and aluminum sulfate with this slurry subsequently being spray dried to form a catalyst comprising ZSM-5 in an amorphous silica/alumina matrix.

Applicants respectfully submit that the Herbst reference clearly fails to disclose or suggest the step in applicants' claimed methods which involves heat treatment of the recovered molecular sieve material at a temperature of from about 50 °C to about 250 °C. The Examiner alleges that flocculant-recovered ZSM-5 from Herbst Example 1 is "dried" which presumably might suggest heat treatment of the recovered molecular sieve (albeit not necessarily at applicants' now-specified elevated temperature). However, in Herbst Example 1 only a portion

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of the recovered ZSM-5 is dried, and that dried portion is not used to make catalyst composites. Rather, the portion of the Example 1 ZSM-5 which is dried was simply used in the separate analytical procedure which served to identify the recovered material as ZSM-5.

As shown in Herbst Example 3, the ZSM-5 material from Example 1 which is used to make the Example 3 composites is not dried at all and, in fact, contains only 33.4% solids. So it is apparent that the Herbst patent fails to describe any molecular sieve recovery procedure which would expressly, inherently or even by implication teach or suggest that the recovered molecular sieve be subjected to the heat treatment step required in applicants' claimed process. Given this situation and the foregoing observations, it is respectfully submitted that the Herbst patent is not properly used in rejection of applicants' amended claims under either 35 USC Section 102 or 35 USC Section 103.

Rejections Over Houser et al

Claims 10-16 have been rejected under 35 USC §102(b) [Claims 10 and 12-16], or alternatively under 35 USC §103 [Claim 13], as being anticipated or rendered unpatentably obvious by Houser et al (U.S. Patent No. 3,902,993, hereinafter "Houser"). The Examiner contends that the Houser disclosure of recovery of zeolites from their synthesis mixtures (by introducing a flocculant, collector and frother to produce a foam or froth that collects zeolite particles and that is then dried at a temperature of from 80 °C to 200 °C) anticipates or suggests the molecular sieve recovery process of applicants' Claims 10-16. Such rejections over Houser are respectfully traversed as they would apply to Claims 10-16 as amended herein.

The Houser patent discloses a particular type of zeolite recovery procedure which is based on the discovery that crystalline aluminosilicate zeolites have a specific affinity for air bubbles and can thus be separated from mixtures containing other residual components by forcing the zeolite particles to float to the surface of the mixture by introducing a froth-forming material to the mixtures from which zeolite separation is desired. The foam having the zeolite crystals

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entrained therein is then collected and dried at 80 °C to 200 °C in order to recover the desired zeolite particles.

While the materials used to bring about the Hauser separation procedure are characterized as including "flocclulants", it is clear that the Houser additives bring about a completely different effect from the flocculants used in the method of applicants' amended Claims 10-16. As now set forth in applicants' claims, the introduction of the flocculant component to the sieve-containing reaction mixture causes the sieve particles therein to agglomerate and to thereafter settle to the bottom of the reaction mixture vessel. This is clearly quite the opposite of the flotation phenomenon which the Hauser materials produce. Flotation is certainly not the same as settling and is not at all suggestive of settling. Accordingly, it is submitted that the type of flocculation and subsequent settling to which applicants' Claims 10 -16 are now directed is not what is taught or suggested by the Hauser patent. Continued rejection of the amended Claims 10-16 over this Houser reference under 35 USC Section 102 or 35 USC Section 103 would therefore be improper and inappropriate.

Rejection Over Wachter et al

Claims 1-9 were rejected under 35 USC §102(b), or alternatively under 35 USC §103, as being anticipated or rendered unpatentably obvious by Wachter et al (U.S. Patent No. 6,153,552). Claims 1-9 have been cancelled by the amendments presented herein. Accordingly, the rejection of these now-cancelled claims over Wachter et al has been obviated.

Conclusions

Applicants have made an earnest effort to place their application in proper form, to establish the unity of their invention and to distinguish their claimed invention from the applied prior art. WHEREFORE, reconsideration of this application, entry of the amendments presented, withdrawal of the restriction requirement and claim rejections under 35 USC §102 and 35 USC §103, and allowance of amended Claims 10-29 are respectfully requested.

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Any comments or questions concerning the application can be directed to the undersigned
at the telephonic number given below

Respectfully submitted,

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Date

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